Scientific Agriculture

La Revue Agronomique Canadienne

VOL. IV. OTTAWA, ONT., DECEMBER, 1923. NO. 4

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Published Monthly by the Canadian Society of Technical Agriculturists.

Forms close on the 23rd day of each month; all copy for advertisements, and changes of advertisements, should be received ten days before the date of issue.

All correspondence should be addressed "Scientific Agriculture, P. O. Box 625, Ottawa, Ont."

Cheques, money orders, etc., must be made payable to the order of the Canadian Society of Technical Agriculturists (C.S.T.A.)

Advertising rates on application.

Subscription price $2.00 *yearly to Canada and the United States; other countries* $2.50.

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Plant Breeding from the Standpoint of Utility.

C. A. ZAVITZ

Professor of Field Husbandry, Agricultural College, Guelph, Ont.

The economic production of an abundant supply of food is one of the greatest problems of mankind. In 1910 the population of the world was two and one half times as great as it was in the year 1800. Increases in population demand corresponding increases in food supplies. Crop production can be increased by extending the acreage under cultivation and by obtaining higher yields per acre. Of these two methods the latter is probably the more important at the present time.

One of the aims of the Field Husbandry Department of the Ontario Agricultural College has been to bring about increased acre yields of high quality on the individual farms. With this object in view over 2500 varieties of farm crops obtained from different parts of the world have been grown under test and their adaptabilities for Ontario conditions carefully studied. From some of the varieties of greatest merit improved strains and varieties have been obtained through careful selections from large nurseries, planted by hand, with thousands of selected seeds. As a last resort, controlled cross-fertilization has been used to originate new varieties superior to those obtained through selection from the varieties of highest record. For some time past we have grown and examined annually an average of about 50,000 hybrid plants of farm crops. The plant improvement work has included grain, forage, root and tuber crops.

The varieties of highest merit obtainable by plant breeding at the College are distributed to the farmers for co-operative experiments on their own farms. If they prove worthy under the local conditions they are soon increased by the experimenters themselves at no additional cost for seed. The surplus is often sold to neighbors and to others to mutual advantage. Through this process the acre yields of several of the farm crops of Ontario have been increased considerably. These increases will be even greater as some of the new varieties become better established and as others are introduced.

Field Peas

The O.A.C. No. 181 variety of field peas was originated at Guelph by crossing the Prussian Blue and the White Wonder. It is a small, smooth, white pea, of good quality and appearance.

Of all the leading varieties of field peas tested at the Ontario Agricultural College the O.A.C. No. 181 has given the highest average yield of grain per acre. In the past five years' results the first, second, third and fifth highest yields were produced by new varieties originated at the College through cross-fertilization. In the tests with other varieties the O.A.C. No. 181 was comparatively early, reaching maturity in ninety-nine days, and the straw was most free from blight and grew to an average length of forty-five inches.

This new variety of field peas was successfully tested in the co-operative experiments on fifty farms throughout Ontario in the past two years. The following was the average yield in bushels per acre per annum of each of the four varieties tested in this way by the practical growers: O.A.C. No. 181, 26.9; Early Britain, 24.4; Potter, 24.3; and Canadian Beauty, 23.1.

Barley

As far back as 1888 we made a world search for the best variety of barley in existence. In the spring of the following year fifty-seven different kinds of barley were grown under test. A variety from Russia under the name of Mandscheuri, gave such good results in the first and in following tests that the peculiar spelling was retained, to identify it from all other varieties, the best of which it surpassed in five years by an average of five bushels per acre per annum. In 1892 this variety was distribut-

ed in pound lots to co-operative experimenters throughout Ontario and was continued in the co-operative test for each of eighteen years. It gave such good returns that from the pound lots, sent to the farmers, this barley was rapidly increased until it became the most extensively grown barley of the Province.

In the spring of 1903 between nine and ten thousand selected grains of the Mandscheuri barley, were planted by hand, at equal distances apart in the experimental grounds. This method gave an opportunity for each plant to show its individuality. At different stages of growth and when ripe the plants were carefully examined, and the most promising ones were selected and threshed, after which the grain from the individual plants was examined. A definite number of grains from each of the selected plants were sown separately in the spring of 1904. The best performers, in decreasing numbers, were continued in the tests from year to year. The plant selected by the writer in 1903 as probably the most outstanding individual was included in the seeding list as number 21, and the progeny gave such excellent results that it was introduced into the co-operative experiments in the spring of 1906 where it has been included continually since that date under the name of O.A.C. No. 21. It gave such good satisfaction throughout Ontario that the farmers increased it rapidly and for the last few years there has been scarcely a field of any other variety of barley grown in the Province.

The O.A.C. No. 21 barley, which was started from a single seed in 1903 is a six-rowed, bearded barley with stiff straw and white grain of good quality. In the experiments at the College the common six-rowed variety of barley has been surpassed by the Mandscheuri in a period of thirty-three years by an average yield per acre per annum of ten bushels, and by the O.A.C. No. 21, in a period of seventeen years by eleven bushels. According to reports of the Statistics Branch of the Ontario Dept. of Agriculture, the barley crop of Ontario has made an actual increase in yield per acre for the last 21 years, in comparison with the two previous decades of 17.44 per cent., or an average yield per acre per annum of four and one-half bushels.

Oats

In the spring of 1891, the Vick's American Banner oats were imported by the College from the introducers of this variety, James Vick's Sons, Rochester, New York. This name was later abbreviated to American Banner and still later to Banner. Various other lots of this variety have been obtained for experimental purposes from time to time from the United States, from Prince Edward Island, from Alberta and from different parts of Ontario.

Previous to 1902 each of one hundred and seventy-four named varieties of oats had been tested in our experimental grounds for at least five years and ten of the best ones had been tested under similar conditions for twelve or more years. Of the white oats, a variety from Siberia was the most productive in the twelve years' tests, surpassing the Banner in average yield per acre per annum by 3.9 bushels. Consequently the Siberian variety was used in 1903 in a large nursery plot in which nearly 10,000 seeds were planted by hand at equal distances apart. From one of the several selected plants from this nursery the O.A.C. No. 72 variety of oats was started. It is a vigorous grower and has a spreading head and white grain of good quality.

For sixteen years in succession the O.A.C. No. 72 and the Banner varieties of oats, have been included in the experiments at the College and the following table gives the average results in maturity, in percentage of hull and in yield of both straw and grain per acre:

Varieties	Percentage of Hull	Yield per Acre	
		Straw (Tons)	Grain (Bushels)
O.A.C. No. 72 ..	28.5	2.2	83.23
Banner	30.3	2.1	73.58

In these experiments the O. A. C. No. 72 in comparison with the Banner had a thinner hull in each of fourteen and a greater yield per acre in each of twelve out of the sixteen years. Each variety required on the average one hundred and ten days to mature.

In 1911 the O.A.C. No. 72 variety of oats was distributed throughout Ontario in connection with the co-operative experiments

which were being carried out through the medium of the Experimental Union. Without a single exception this new variety of oat has given a higher average yield per acre than any of the other varieties used in the co-operative tests, conducted by farmers, in each of the past eleven years. It soon made a record for itself and was increased rapidly from the pound lots used in the tests conducted on the individual farms. In 1913 one farmer entered five acres in his local Field Crop Competition, and received first prize. In the last seven years, of the 990 first prizes which were awarded to fields of standing oats in connection with the Field Crop Competitions throughout Ontario, the O. A. C. No. 72 received, 521; the Banner, 220; and all other varieties combined, 249.

In the competitions of threshed grain at the Canadian National Exhibition, Toronto; at the Central Canada Exhibition, Ottawa; at the Provincial Winter Fair, Guelph; and at the Ottawa Winter Fair, the O.A.C. No. 72 received seventy-two and the Banner forty-one prizes in the last four years, the former surpassing the latter in awards from fifty to one hundred per cent. at each of these exhibitions. The standard varieties of oats now recognized by the Ontario Association of Fairs and Exhibitions are, O.A.C. No. 72, Banner, Abundance, Granary Filler, Yellow Russian and Gold Rain.

Early Oats

The O.A.C. No. 3 variety of early oats was originated at the College from a selected plant of the Daubeney variety. It is exceptionally early, yields well and produces a grain of high quality, being thinner in the hull than any other named variety which has been tested at the College. Some other varieties of early oats, however, are now surpassing it in yield per acre although they are of lower quality. We have now a number of cross-bred varieties from which we hope to get an early oat combining high yield and good quality.

Winter Wheat

In 1882 the Dawson's Golden Chaff variety of winter wheat was started in Ontario from a single outstanding plant, selected by Robert Dawson in his field of the White Clawson variety, which was badly lodged. After we tested this new wheat at the College, we sent it out to the farmers for co-operative experiments in the fall of 1893 and in nearly every year since that date. For some time past it has been the most extensively grown variety of winter wheat in Ontario.

The O.A.C. No. 104 variety of winter wheat was originated at Guelph, by crossing the Dawson's Golden Chaff and the Bulgarian. It is a white wheat with a beardless head and with white chaff.

In thirteen years' comparative tests with the Dawson's Golden Chaff, this new wheat has given a better quality of grain and an increased average yield of 2.2 bushels per acre per annum. It has been taller, almost as stiff in the straw and more hardy and it has had slightly less hessian fly.

Of the five leading varieties of winter wheat tested by farmers throughout Ontario, the O.A.C. No. 104 was the most popular and it headed the list in yield of grain per acre in five out of six years. It is increasing rapidly in general cultivation and thousands of bushels of seed are now being offered for sale by practical farmers who live in more than one half of the counties of the Province. It is recognized by the Ontario Association of Fairs and Exhibitions as one of the three standard varieties of winter wheat in this Province; the other two being the Dawson's Golden Chaff and the Imperial Amber.

Spring Wheat

The O. A. C. No. 85 variety of spring wheat was originated at Guelph, by crossing the Red Fife and the Herison Bearded. It is a red wheat of good quality and has a bearded head with white chaff.

In ten years' experiments at the College it gave the highest average yield of grain per acre of the twenty varieties of spring wheat grown under similar conditions, surpassing the Red Fife each season and the Marquis in eight out of the ten years. The follow-

per measured bushel and of bushels per acre per annum of each of four of the twenty varieties tested: O.A.C. No. 85, 60.0 and 32.9; Wild Goose, 61.4 and 31.2; Marquis, 60.6 and 29.2; and Red Fife, 59.1 and 28.1. The crop of the O. A. C. No. 85 was partially lodged in each of four and that of the Marquis in each of two years out of the ten. The former in comparison with the latter variety was much more free from rust, six inches taller and three days later in reaching maturity.

Spring Rye

Some seed of a leading variety of winter rye was obtained by the College from the greatest rye breeder in Germany. This was gradually changed into a spring variety, and from the many plants some of the best were selected and were tested out individually. From one of these plants the O.A.C. No. 61 variety of spring rye was originated.

The O.A.C. No. 61 spring rye has given an average yield of 3.03 bushels of grain per acre per annum, over the Common variety of spring rye in Ontario in the tests at the College, extending over a period of seventeen years. It is interesting to note that in each of sixteen out of the seventeen years the O.A.C. No. 61 gave the highest returns.

Millet

The O.A.C. No. 92 variety of Millet was started from a single plant of outstanding merit, which was selected from a nursery plot at the College. It is a millet of the foxtail type, has a leafy growth and produces seed of a reddish color.

Of the eight varieties of all types, in the College experiments for nine years, the O. A.C. No. 92 variety gave the highest average yield of seed per acre. In another series of experiments it gave the highest yield of both green fodder and cured hay per acre of the six varieties of foxtail millets, but was surpassed in yield of fodder by both the Japanese Panicle and the Japanese Barnyard. Each of the last two varieties, however, when compared with the former variety requires a longer season for growth and produces fodder of a much coarser quality.

Value of Increased Acre Yields

The Ontario Department of Agriculture furnishes information which shows that the average yearly increases in acre yields, of Barley, Oats, and Winter Wheat, for the last twenty-one years, in comparison with the years previous, amounted to a total of 249,730,410 bushels, which valued at average market prices reached a total of $161,049,-877.71. This is about 400 times as much as the entire cost of the Field Husbandry Department of the Ontario Agricultural College, from the time the writer was appointed to the work in 1886 up to the present.

It might be noted that these increases in yield per acre have been made in spite of a natural tendency towards a decreased acre yield in a comparatively new country where commercial fertilizers are not used generally with farm crops.

Undoubtedly, the general use of these high yielding new varieties of good quality has been the greatest factor in bringing about these substantial increases in acre yields throughout Ontario.

Poultry Husbandry in British Columbia.

R. J. SKELTON

University of British Columbia, Vancouver.

Poultry keeping as a specialized branch of Agriculture has grown to such proportions in British Columbia that it has become an important industry. Particularly since the war years has development been rapid. Where formerly quantities of eggs were shipped into the Province to meet the demand, now the position is reversed and some fifty carloads of eggs were shipped to Eastern points from Vancouver during the last year.

The rapid increase in egg production brought about a marketing problem which had to be met if poultrymen were to reap the benefits of this expansion. The situation was met by the poultrymen of the Fraser Valley who about four years ago organized the B.C. Poultrymen's Co-operative Exchange. The writer has no intention of dealing at length with the history of this young organization. It met with some failure and considerable success, so that to-day the Association with its main office in Vancouver and branch offices in Victoria and Nelson, has a membership of about 1700 producers who control the output of at least 400,000 birds. During the year 1922 the Association handled 1,250,000 dozen eggs, whereas during the last six months the Association has handled 3,500,000 dozen (1).

The Dean of the Faculty of Agriculture of the University of British Columbia, recognizing the growing importance of the poultry industry in the Province, in 1921 authorized a financial survey of representative poultry plants in the Fraser Valley and Vancouver Island, in order that information with respect to the financial organization of the poultry farm should be available to all prospective poultrymen in the Province.

The survey was carried out under the supervision of the Department of Poultry Husbandry of the University and covered the year beginning January 1st, 1921. The results of this survey were published later (2). The survey was continued on a larger scale over a period of one year beginning November 1st, 1921. The purpose of this article is to deal briefly with a few phases of the poultry business as revealed by this survey.

TABLE I. AMOUNT AND DISTRIBUTION OF INVESTMENT

Capital per Farm			Land & Bldgs. Including Dwelling		Stock		Machinery		Feed & Supplies	
	No. of farms	Average total capital	Value	Per-cent of total	Value	Per-cent of total	Value	Per-cent of total	Value	Per-cent of total
$4,000 or less	32	$2947.54	$2184.20	74.1	$547.03	18.6	$199.66	6.8	$16.94	.6
4,001 to 6,000	23	5083.09	3692.24	72.6	946.96	18.6	412.22	8.1	42.38	.8
6,001 to 8,000	20	6784.39	5049.93	74.4	1164.50	17.2	521.63	7.7	48.33	.7
8,001 to 10,000	5	8624.53	6511.15	75.5	1287.40	14.9	820.38	9.5	5.60	.1
10,001 to 12,000	9	11012.41	7996.11	72.6	2002.11	18.2	955.89	8.7	58.31	.5
12,001 and over	11	15003.93	11329.14	75.5	2050.36	13.7	1367.86	9.1	256.57	1.7
Average	100	6542.08	4850.66	74.1	$1095.85	16.8	537.75	8.2	$55.02	.8

Something has been said of the poultry business as a growing industry. The survey in 1921 on 65 farms showed an increase of 32% in the number of birds carried at the end over the beginning of the year. The following year on 100 farms the number of birds carried at the beginning of the year was 58,390 and 71,326 birds were on hand at the end of the year, an increase of 22%. This shows that not only more men were taking up poultry keeping as a means of livelihood but those in the business were appreciably increasing their flocks.

The proportionate amount of investment in real estate and personal property is shown in Table 1. The average investment was $6542.08 of which 74.1% was in real estate, 16.8% in stock, 8.2% in machinery and equipment and .8% in feed and supplies. A further study of investment in real estate is shown in Table 2.

The total estimated investment in real estate was $4850.66 of which 48.3% was in land and 51.7% in buildings. As the average area per farm was 12.3 acres, the value of land per acre was $190.60. The average number of birds per farm was 584. The total investment per bird was $11.20 (Table 1) of which $8.31 per bird was investment in real estate.

TABLE II. DISTRIBUTION OF INVESTMENT IN LAND AND BUILDINGS

Capital per Farm	No. of Farms	REAL ESTATE								
		Total Investment in Real Estate	Investment in Land	Per Cent.	Dwelling	Per Cent.	Poultry Bldgs.	Per Cent.	Other Bldgs.	Per Cent.
4,000 or less.....	32	$2184.20	1099.20	50.3	673.76	30.8	340.53	15.6	70.70	3.2
4,001 to 6,000.....	23	3692.24	1879.17	50.9	899.02	24.3	716.28	19.4	197.77	5.4
6,001 to 8,000.....	20	5049.93	2437.05	48.3	1284.50	25.4	1049.75	20.8	278.63	5.5
8,001 o 10,000.....	5	6511.15	2185.00	33.6	2725.00	41.9	1282.00	19.7	319.15	4.9
10,001 to 12,000.....	9	7996.11	3711.11	46.4	2175.00	27.2	1773.89	22.2	336.11	4.2
12,001 and over.....	11	11329.14	5725.23	50.5	3454.55	30.5	1667.27	14.7	482.09	4.3
Average.....	100	4850.66	2344.39	48.3	1391.28	28.7	890.81	18.4	224.17	4.6

TABLE III. RELATION OF TOTAL INVESTMENT TO PROFITS

Capital per Farm	No. of Farms	Average Total Investment	Birds per Farm	Total Investment per bird.	Farm Income	Interest on Investment at 7%	Labor Income	Percent Return Investment
$4,000 or less....	32	$2947.54	273	10.80	636.93	206.41	430.52	21.6
4,001 to 6,000..	23	5083.09	497	10.25	1087.93	355.85	732.08	21.4
6,001 to 8,000..	26	6784.39	605	11.21	1075.56	474.91	600.65	15.9
8,001 to 10,000..	5	8624.53	708	12.18	1136.91	603.72	533.19	13.2
10,001 to 12,000..	9	11012.41	1227	8.98	1206.30	770.87	435.43	11
12,001 to 14,000..	11	15003.93	1044	14.37	1541.75	1050.28	491.47	10.3
Average.....	100	$6542.08	584	$11.20	$1004.15	$457.95	$546.20	15.4

For purposes of comparison the farms were grouped according to investment. It should be explained that included in the Farm Income was a sum representing the value of all perquisites the farm supplied the operator, including rent for the dwelling. Rent was allowed at the rate of 10% of the value of the dwelling. On the other hand, the dwelling was considered as part of the farm investment, and depreciation, interest and insurance were charged as part of the farm expense. Briefly then the receipts and expenses with respect to the dwelling practically balanced.

The average farm income as shown in Table 3 was $1,004.15 of which $139.13 was house-rent and $150.35 was farm perquisites, which made a total of $289.48 as the value of the operator's living supplied by the farm.

The farm income increased as did the investment but the per cent. return on investment steadily declined as investment increased.

In the previous tables the farms were grouped according to total investment. In table 4 the grouping was according to number of fowls per flock. It should be explained that Labor Income represented the operator's profits after all expenses and interest on investment at 7% were written off. The table is of interest in that it shows that the Labor Income per bird decreased as the number of fowls per flock increased yet the labor income per farm steadily increased. Fifteen farms returned minus labor incomes and one farm returned a minus farm income. On the other hand, one farm returned a farm income of $3919.40.

Table V is given to show in detail the various sources of farm receipts. Egg receipts per bird averaged $3.29. The column showing increase in inventory would indicate that the larger groups of farms were making no efforts to increase their flocks. An average of 80% of total receipts was obtained from poultry or poultry products. Group 1 showed that the greater part of receipts other than from poultry was obtained from labor performed by the operator off the farm. As the flocks increased in size the operator devoted his whole time to his farm business.

RELATION OF NUMBER OF FOWLS PER FLOCK TO PROFITS

TABLE IV.

	No. of Farms	Average number of fowls per flock Nov. 1921	Average No. of hens per flock Nov. 1921	Cockerels per flock	No. of hens per cockerel	Labor Income	Labor Income per Hen	No. of farms with minus labor income
200 or less	17	155	152	4	38	$318.09	$2.03	2
201 to 400	23	298	294	4	73	404.63	1.38	2
401 to 600	21	499	492	7	70	625.49	1.27	2
601 to 800	20	693	679	13	52	692.50	1.02	4
801 to 1000	7	916	888	28	32	760.40	0.86	1
1001 and over	12	1509	1469	41	36	905.27	0.62	4
Average	100	584	571	13	45	546.20	$0.96	15

TABLE V. RELATION OF SIZE OF FLOCK TO RECEIPTS

Fowls per Flock	No. of Farms	Gross Receipts	Egg Receipts	Egg receipts per hen	Poultry Receipts		Crop Receipts	Other Receipts	Poultry Diversity Index
					Increase of sales over purch's's	Increas in Inventory			
200 or less	17	$1387.10	$ 637.45	$4.19	37.58	$228.65	$91.52	$391.90	65.2
201 to 400	23	1829.96	1012.26	3.44	112.77	209.30	68.22	427.41	72.9
401 to 600	21	2809.13	1692.36	3.44	379.29	248.33	99.33	389.82	82.6
601 to 800	20	3641.63	2384.51	3.51	527.18	255.65	89.90	384.39	87
801 to 1001	7	4082.13	2790.27	3.14	654.30	41.29	178.98	417.29	85.5
1001 and over	12	6494.90	4829.70	3.29	916.92	14.33	142.28	591.67	88.7
Average	100	3030.07	1865.38	3.29	384.20	195.67	101.00	483.82	80

The foregoing tables throw some light on the comparative receipts and profits on different sized farms. Table 6 deals with the division of expenses on these farms. The average total expense per bird was $3.47 of which $0.26 was depreciation charges, $2.36 for feed and the remainder $0.85 was miscellaneous operating expenses. The majority of the farms represented in the survey kept one or more cows and some operators kept a horse, but the total feed purchased was charged against the poultry. This leaves some ground for criticism but invariably the farm operator made no attempt to keep poultry feed separate hence it was impossible to get the feed cost for poultry alone unless some arbitrary method of writing off an allowance for livestock other than poultry had been adopted.

Cost of Production per Dozen Eggs.

The average farm presents many difficulties when an attempt is made to calculate the cost of production of a single farm product, the reason being that several products are produced on a single farm in which the means of production interlock the one with the other. It is difficult, in fact practically impossible to separate and assign the various costs in an exact way. Some of these dif-

TABLE VI. RELATION OF SIZE OF FLOCK TO EXPENSES

Fowls per Flock	No. of Farms	Total Expenses		Depreciation		Feed Cost		Farm Income	Income Per Bird
		Per Flock	Per Bird	Per Flock	Per Bird	Per Flock	Per Bird		
200 or less	17	$766.50	$4.95	$88.37	$0.57	$461.07	$2.97	$620.60	$4.00
201 to 400	23	1085.31	3.64	94.41	.32	771.36	2.59	701.17	2.35
401 to 600	21	1776.58	3.56	128.30	.26	1278.41	2.56	1032.55	2.07
601 to 800	20	2441.54	3.52	160.38	.23	1670.46	2.41	1200.09	1.73
801 to 1000	7	2759.48	3.01	183.78	.20	2051.89	2.11	1322.65	1.44
1001 and over	12	4928.73	3.27	351.83	.23	3142.53	2.08	1566.17	1.04
Average	100	2025.93	3.47	150.84	.26	1372.29	2.36	1004.15	1.72

ficulties are admirably pointed out by H. C. Taylor (3) as follows:

> "On the typical dairy farm, corn, small grain, clover hay, and pasture, cattle, horses and hogs are all produced. The same plow, harrows, and horses are used for the various crops which require attention at different seasons and the same laborers are used for crops and livestock. When the corn is being cultivated, the corn is not only being benefited, but the land is being put into better condition for the small grain crop which will be grown the next year. When the land is prepared for small grain, the seed bed for the clover is being prepared, and oats or barley serves as a nurse crop for the clover plant which in turn is able to draw upon the nitrogen of the air and provide plant food needed for its own growth and for the corn crop which is to follow. Hence, the costs of these three crops are said to be joint costs."

The greater the diversification, the greater would be the difficulties to be met in assigning costs. In the case of poultry farming, specialization, as already pointed out, is practised to a high degree, so that many of the difficulties met with in diversified farming do not apply.

The cost of producing eggs was calculated on 58 of the farms included in the survey. The method of calculating cost was as follows: From the total farm expenses was deducted all revenue from sources other than from eggs. The remainder was taken to represent the total cost of production. A brief summary of results is as follows:

No. of farms	58
Total Investment	$377,190.83
Birds on hand beginning of year	35,477
Eggs sold (dozens)	386,015
Egg produced (dozens)	397,983
Eggs produced per bird	135
Average price per doz. eggs sold	0.31

FARM EXPENSES

Current expenses	$109,184.09
Depreciation	8,918.18
Interest on investment at 7%	26,403.36
Total	$144,505.63
Gross receipts	178,778.83
Receipts from sale of eggs	119,959.68
Receipts from sources other than eggs	58,819.15
Net cost of eggs	85,686.48
397,983 dozen eggs costs	85,686.48
1 dozen eggs cost	0.215

In making the above calculations the operator's labor was not considered. Briefly then, the operator was able to carry on his business, pay interest and depreciation and had remaining as wages for himself the sum of $697.50.

REFERENCES

(1) G. C. Milnes, Managing Director, B.C. Poultryman's Co-operative Exchange, 1140-1150-1158 Hamilton St., Vancouver.

(2) Province of British Columbia, Agricultural Department Circular No. 41.

(3) Agricultural Experiment Station of the University of Wisconsin. Bulletin 292 by H. C. Taylor, 1918.

Registered Seed Production in Saskatchewan.*

STANLEY H. VIGOR

Field Crops Branch, Saskatchewan Department of Agriculture, Regina.

During the past twelve years Saskatchewan farmers have exhibited grains at various International Grain and Hay Shows and Soil Products Expositions, and in that time have secured the world's sweepstakes in wheat nine out of eleven times they have shown. This is an enviable record and consequently the superiority of Saskatchewan wheat has become well established and widely known. It is imperative that the record made by Saskatchewan be maintained in order that she may keep her share of the world's markets for wheat. The advertising brought to this Province by these efforts has resulted in enquiries from outside sources for large quantities of seed grain and Saskatchewan has here an unique opportunity for extending and developing a market for grain of improved quality.

The total production of wheat in Saskatchewan in the thirteen years 1909-21 has been exceeded in the six years 1909-13-14-18-19-20 by the states of North Dakota and Kansas, but the per capita production has been exceeded only twice and that by North Dakota in the years 1913 and 1918.

The population of Kansas has increased from 1,690,949 in 1910 to 1,769,257 in 1920. The per capita production therefore is based on an average population of 1,731,000. Similarly the average population of North Dakota is figured 611,970. (Taken from Statistical Abstract of the U.S.A.). The population of Saskatchewan in 1911 was 492,432, in 1916, 647,835, and in 1921, 757,510. The average for the five years 1911-16 is 570,133 and for the five year period 1916-21, 702,672. These averages have been used in computing the per capita production.

The competition in the International Grain and Hay Show held annually at Chicago becomes more keen every year, consequently

*An address before the Saskatchewan Field Husbandry Association, January 16, 1923, University of Saskatchewan.

Table showing actual and per capita production of Wheat in Saskatchewan and in years when the production has exceeded that of Saskatchewan.

Year.	Sask. Production All in Bushels	State Production	Per Capita Production Sask.	Per Capita Production Other States
1909	90,215,000	90,762,000 (N. Dak.)	183.2	148.3
1910	72,666,399			
1911	97,244,769			
1912	107,167,700			
1913	112,369,405	143,820,000 (N. Dak.)	196.2	235.00
1914	74,610,643	177,200,000 (Kan.)	138.1	104.8
		81,592,000 (N. Dak.)		131.7
1915	214,794,720			
1916	121,864,454			
1917	117,921,300			
1918	92,493,000	102,008,000 (Kan.)	131.2	58.9
		105,672,000 (N. Dak.)		172.7
1919	89,993,685	160,276,000 (Kan.)	126.3	92.6
1920	113,135,274	143,078,000 (Kan.)	158.7	82.7
1921	201,347,483			

the capture of the sweepstakes is becoming more difficult and it is therefore gratifying to find Saskatchewan still maintaining her supremacy. Last December there were about 400 entries in the various classes of wheat from which the sweepstake sample was chosen. Of these about 100 were entered in the hard red spring wheat class and 100 in the hard red winter wheat class, and these two classes are the ones which compete seriously against each other for the sweepstakes. It is interesting to note that the Marquis variety has won the sweepstakes every time.

By way of parenthesis, a word to any who doubt the value of an experimental farm, may be in order. Marquis wheat, which has put millions of dollars into the pockets of western farmers was bred and selected on an experimental farm. So was also O.A.C. No. 21 barley. These two products alone of the experimental farms have made their expense warrantable. Indeed the extent of the field for Marquis wheat has not been limited, as statistics show that Minnesota is discarding her old varieties in favor of Marquis. In 1914 3.1% of all the wheat sown in that State was the Marquis variety, while in 1921 74.8% was Marquis. In North Dakota it rose from 5% to 41.7% in the same period, while in South Dakota 49.9% was Marquis in 1921, 42.4 Durum and 7.7 was other varieties.

Since the farmers of the N.W. States are adopting the Canadian bred variety which is so successful in Saskatchewan we might have reason to fear their competition. We have the advantage, however, of having few varieties which are therefore fairly pure and have a high quality, while in some States the varieties have become mixed and the general standard lowered.

In order to cater to a seed market and even to a commercial market it is essential that the different varieties be kept pure, in order that the quality be maintained. Losses in grading are sometimes due to a mixing of varieties, such as yellow and white oats and the bread and macaroni wheats. The high milling and baking qualities of prairie grown wheat bring for it a demand from the millers, but other countries are producing high quality grain and competing with us. Therefore Canada, and Saskatchewan particularly, cannot afford to produce anything but the best, or else be content to receive lower prices for their grain and even a lesser demand for it. Some of the varieties of hard red spring wheat grown in Saskatchewan are inferior in milling quality to Marquis and Red Fife and should not be grown, e.g. Prelude, Pioneer, Preston, Chelsea and Stanley. We strongly recommend the growing of only one variety of each kind of grain on one farm in order to maintain purity.

This winter* a number of cases have come to our notice of losses to farmers through the growing of more than one variety of wheat on the same farm. Durum and Marquis varieties were used and became mixed in the field by one of the varieties volunteering and thereby becoming mixed with the other variety. The grain was graded at Winnipeg, Durum and Spring mixed, and in one case the consignment fetched 70c per bushel when a carload of 1° grown on the same farm fetched $1.05¼ sold on the same day. As Durum wheat was bringing just about as much on the Winnipeg market as 1°, this represents a loss of 35c a bushel which could have been avoided.

To grow pure seed a small seed plot varying in size up to 1 acre should be kept. This plot should be gone over two or three times during the summer to pull out any off type, diseased, or otherwise undesirable heads. The Canadian Seed Growers' Association was organized for the improvement and recognition of high quality seeds of the field crops, and seeds grown under its regulations receive recognition as registered or improved seed. The fields of growing grain are inspected during the growing season when the purity of the crop and its freedom from disease are most easily determined. When seed is sold as "registered", it is inspected during the winter months after it has been cleaned and sacked and if it is satisfactory the sacks are tagged and sealed. The C.S.G.A. keeps a record of the production and of all sales of registered grain in order that its purity may be established, and traceable

*1922-23.

MULTIPLYING FIELDS INSPECTED 1917-1922

WHEAT

ACRES

Variety	1917	1918	1919	1920	1921	1922
Marquis	1,217.25	1669.75	2812.50	5409.25	12282.80	16332.26
Red Fife	60	83	27.75	45.75	13.75	17.10
Kitchener	17.50	9.25	442	759.65	592.8	440.85
Prelude	1	10				
White Fife	50	1				2.00
Red Bobs			72.56	339.88	78.20	160.10
Ruby				31.84	158.80	134.60
Early Triumph					67.	8.33
Kubanka						377.50
Acme						10.
Kota						.01
Total	1,346.75	1773.	3354.81	6586.37	13192.35	17482.75

OATS

Variety	1917	1918	1919	1920	1921	1922
Victory	184.25	253.75	31.50	70.75	514.56	1075.35
Banner	96.25	287.20	358.75	1226.60	1614.50	1618.80
Abundance	55.75	23	23.25	41.	87.25	126.
Gold Rain	102	145	90	155.50	86.	86.20
Ligowo			3	15	10	2.25
Leader				50	115	5
Great Russian				1.50		20
Liberty				1		
Gerlach					12.50	43.50
Total	438.25	708.95	506.50	1561.25	2439.81	2977.10

BARLEY

Variety	1917	1918	1919	1920	1921	1922
O.A.C. 21	126.	2.50	129	321	57.25	24
Canadian Thorpe	6	1	1	9.75	29	20
Manchurian	.16		8	62.75	8.50	.52
Six rowed	3.75					
Silver King			.30	2.75	34	41
Barks					46.25	12.25
Hannchen					3	35.60
Keystone						26.50
Duckbill						.10
Two-rowed						
Total	115.91	3.50	238.30	396.25	178.	211.45

POTATOES

Variety	1917	1918	1919	1920	1921	1922
Various	2.68	6.20	4.78	1.24	3.79	5.90

TOTAL MULTIPLYING FIELDS OF WHEAT, OATS, BARLEY AND POTATOES INSPECTED IN YEARS 1917-1922:

1917	108 —	1922.60
1918	98 —	2491.65
1919	180 —	4104.50
1920	251 —	8649.50
1921	352 —	15814.38
1922	490 —	24782.20

at any time, in a manner somewhat similar to that of livestock in a herd book.

The importance of obtaining pure seed that has been tested for high yielding and other desirable qualities cannot be over-emphasized. The Field Husbandry Department of the University of Saskatchewan, and the experimental stations in the Province are continually testing large numbers of strains of the different varieties and from these select the best. These are increased and distributed to farmers who cannot do better than to secure some of this seed from the experimental farms, or from farmers who have already obtained some and are taking care to keep it pure.

Seeds from the experimental farms are considered elite stock by the C.S.G.A. and the first crop from these seeds is considered first generation. A large number of these seeds have been distributed by the Field Husbandry Department of the University to members of the Field Husbandry Association and many of these members have asked for inspection of their fields with a view to registration of the crop. The following figures show the increase in the number of field inspections made by the Field Crops Branch of the Department of Agriculture during the last six years 1917-22. It is particularly noteworthy that Marquis wheat, Banner and Victory oats have shown continued steady increase while other varieties have had a varied career.

The growing of registered seeds can be largely increased by the efforts of the members of the Field Husbandry Association. These members number around 800 and new members are continually joining. They can be of considerable service to the Province by furnishing all information they can to the College or the Department, especially by answering any questionnaires which may be sent them from time to time.

In order to help growers dispose of their seeds the Field Crops Branch of the Department of Agriculture has again published a seed catalogue. The standards of this catalogue have been raised a little this year, consequently only samples of the highest quality have been listed. Germination and purity are the first considerations in judging samples, but the general appearance is also of importance. In live stock, breeding must be accompanied by a good individual, so also in the case of seeds, breeding must be accompanied by a good sample. Any growers, therefore whose seeds were not listed should not be disappointed, but should remember that a seed catalogue can be of most value when it is known that it is a practical guarantee of the seeds listed. Buyers will feel quite safe in placing orders with those growers whose seeds are listed in it. In several instances, samples of good seeds were submitted, but they were uncleaned, and therefore could not be considered. A little work with a fanning mill would have made good samples fit for the catalogue. The catalogue is being widely distributed, it being sent to Grain Growers' Associations, Secretaries of Rural Municipalities in Saskatchewan, bank managers, farm journals, experimental stations in western Canada and the North Western States. It has also been sent to a number of seed houses, district representatives and county agents in Western Canada and the North Western States. At present, the Field Crops Branch has been directly instrumental in securing orders for two carloads of registered seed wheat from the States to the South.

SUMMARY.

1. Saskatchewan has captured 9 sweepstakes during the 11 times she has exhibited.
2. A demand for Saskatchewan wheat and other grains has been created.
3. Necessity of maintaining quality and purity of wheat in order to fill this demand.
4. Growing single varieties with above end in view.
5. Publication and distribution of catalogue by Department of Agriculture.

Do We Need More Fundamental Work in the Study and Teaching of our Crop Problems?

O. McCONKEY,

Field Husbandry Department, Ontario Agricultural College, Guelph.

The last century has witnessed a remarkable evolution and advance in Crop Studies and Crop Management. Plant Breeding, Plant Introduction, Regional Adaptation of Crops, Disease Control, Rotation and Fertility Studies, have all added their quota to this great advance and helped to augment the agricultural wealth of the world.

It is a remarkable record of achievement—a glorious showing that these pioneers have made, working as they were, under tremendous handicaps. Are we, of the present generation, going to make as good a showing in the next century?

If we are going to make the contribution to Agriculture that we should, must we not call in the great arms of science and train them on our specific crop problems?

Must not the Agronomist look on the plant and its environment with the same understanding and fundamental training as the physician looks upon the human body?

Can we not in some measure at least bring to a focus, through the medium of Crop Ecology perhaps, the great fields of science underlying Agronomy, i.e. Genetics, Botany, Physiology, Nutrition, Morphology, Chemistry, Fertility, Soil Solution, Availability, etc., so that our students will see the definite application of these sciences to actual crop problems, to everyday farm operations, so that when they are called upon to solve a crop problem they are equipped with the fundamental knowledge with which to reason it out? Here and there men who have caught the "Dynamic" of original work will proceed along research lines to add to the knowledge of fundamental principles underlying crop productions.

Crop Ecology may be viewed from two distinct angles. It is a natural centre from which the various phases of the scientific sides of agriculture radiate. This is because the basis of Crop Ecology is plant physiology. An increase in the yield of crops is the result of changes in controlled conditions. These may be in the soil or in the plant. If the latter, the favorable variations are made permanent by selection and plant breeding; if in the former, we have the agronomists and plant physiologists to experiment for certain definite ends and to explain why we arrive at certain results.

Crop Ecology tries to show how the various aspects of plant life, the adaptations, the growth habits, the disease resistance, must be brought to a focus for further progress in agriculture. Success in the future rests, not in allowing the pathologist and the geneticist and the agronomist to jog along independently, but in combining their forces, and for the business end of farming the economist must be called in to complete the chain stretching from the producer to the consumer.

Strange as it may seem after so many years of our experimental stations and colleges of agriculture, the living plant has not yet been seriously considered the logical starting place about which agricultural instruction is to be grouped.

"Throughout the ages the growth of plants has interested thoughtful men. The beginning of plant culture goes far back into history. The mystery of the change of an apparently lifeless seed to a vigorous growing plant never loses its freshness."

Let us review for a moment some of the mile posts in the search for the principles underlying the production of crops for which we are still groping.

The Search for the Principle of Vegetation.

Almost five centuries ago Palissy said, "You will admit that when you bring dung into the field it is to return to the soil something that has been taken away. When a

plant is burned it is reduced to a salty ash called alcaly by apothecaries and philosophers—every sort of plant, without exception, contains some kind of salt. Have you not seen certain labourers when sowing a field with wheat for the second year in succession, burn the unused wheat straw which had been taken from the field? In the ashes will be found the salt that the straw took out of the soil: if this is put back, the soil is improved. Being burned on the ground it serves as manure because it returns to the soil those substances which had been taken away." These facts have since been confirmed in part from the study of Chemistry. Early in the sixteenth century, a search for the "Principle of Vegetation" was begun by Von Helmont. His work is regarded as the classic of its time. In speaking of his experiment, Von Helmont says, "I took an earthen vessel in which I put 200 pounds of soil dried in an oven, then I moistened with rain water and pressed hard into it a shoot of willow weighing five pounds. After exactly five years, the tree that had grown up weighed 169 pounds and about 3 ounces. But the vessel had never received anything but rain water or distilled water to moisten the soil, when this was necessary. I did not take the weight of the leaves that fell in the autumn. In the end I dried the soil once more and got the same 200 pounds that I started with, less about two ounces. Therefore, the 164 pounds of wood, bark and root, arose from the water alone." A notable contribution, but only a part of the truth was found.

Then came Glauber who believed that saltpetre contained these important "principles." Kulbel was convinced of their presence in "humus." Tull, writing about the middle of the sixteenth century states, "It is agreed that the following materials contribute in some manner to the increase of plants, but it is disputed which of them is that very increase of food: (1) Nitre, (2) Water, (3) Air, (4) Fire, (5) Earth. Although nitre, water, air, fire and heat aid plants in growing, the earth is the real food and increase of plants. Nitre and other salts prepare the earth by dividing its particles, as a knife cuts and prepares food; water and air move it, and by carrying and fermenting it in the juices of the plant to produce heat. Too much nitre corrodes a plant, too much water drowns it, too much air dries the roots, too much heat burns it. Tull's work closes the period known as the epoch of a search for the Principle of Vegetation.

Early Efforts to Ascertain "Plant Nutrients"

According to Russell, the year 1750 marks the beginning of the epoch regarded as a search for "Plant Nutrients". It was about 1755 when Home was set to work by the Edinburgh Society "to try to find how far chemistry will go in settling the principles of Agriculture." Home seemed to think that the whole art of Agriculture centered in the "nourishing of plants." His chief contribution to plant culture was the emphasis he placed on a study of the function of "Plant Nutrients."

Priestly in 1771 pointed to the fact "that plants instead of affecting the air in the same manner as animal respiration, reverse the effects of breathing and tend to keep the atmosphere pure and wholesome."

Upon the above observations, coupled with Priestley's discovery of Oxygen, are based the most important principles of plant growth.

Up to about 1800, studies were largely of a qualitative nature, but the work of De Saussure on quantitative gaseous exchange in plants laid the foundation for work now included in the modern period of plant investigations.

Early in the eighteenth century Liebig announced that, "The crops on a field diminish or increase in exact proportion to the diminution or increase of the substances conveyed to it in manure." The fundamental truths that he contributed, marked the beginning of a new era and he prepared the world for the splendid progress that followed.

About the time Liebig was startling the world with his theories, Von Sachs appeared. In April 1859 Sachs was called by Professor Stockhart to the Experiment Station at Tharand to perfect and extend his researches on the water nutrient solution method and to direct the work of the Experiment Stations along lines of experimental plant physiology. Later at the Agricultural Academy at Bonn

Poppelsdorf, he gave us the now classic contributions on germination, material transportation, and translocation, and thus laid broad and deep the foundations of an experimental era of plant nutrition. His chief interest in botany seemed to be in its application to agriculture. It is to be regretted that botany and agriculture alike failed to follow his leadership in the application of plant physiology to agriculture.

The intimate and definite relation between two fields so well recognized by Stockhart and so masterfully developed by Sachs was all but broken with the latter's passing. A field so auspiciously developed had been allowed to lie fallow for more than a century.

The Need of Botany in a Study of Crop Problems.

Just why botanists of the immediate past have overlooked such an opportunity for service is not clear. "What is the matter with botany" is a favorite question nowadays. Piper suggests that intellectual isolation is one cause of this indifference. Probably "provincialism" is at the foundation of certain troubles. One writer believes that a feeling of superiority is a contributing factor to such a lack of interest in crop problems on the part of some botanists. Perhaps it is not impertinent to ask the question, "What is the matter with agronomists specializing in crop production?" If the botanists are somewhat at fault, so are the agronomists. Good botanical training has been available to them, but few have sought such equipment as botany can give. It must be admitted that both groups are at fault; and as a result, fundamental investigations in crops are few and are progressing slowly. We seem to be yet in the variety testing stage—in the "cut and try" epoch.

Little is yet known of sensitive or critical period in crop plants in relation to environmental factors such as moisture, temperature, and light as viewed from the physiological aspect, more particularly in its application to field conditions.

The basis of attack, then, must be the study of the relationship of environmental factors to the various life stages of crop plants. These life stages or physiologic phases may be grouped as follows:

(1) The Seed Stage.
(2) The Germination Stage.
(3) The Plantlet Stage.
(4) The Active Growth or Vegetation Stage.
(5) The Reproduction Stage.

A thorough knowledge of the physiological behavior of farm crops must include a knowledge of the life stages, each in relation to their several factors of environment. When we have such information it is not difficult to determine the critical phase or period. We are convinced that a clear understanding of the critical periods is necessary before we can proceed far in crop adaptation studies.

In this plea for more fundamental work in the solving of our Canadian agronomic problems it seems most appropriate to quote Dr. Charles E. Saunders, Ph. D., L. L. D., whose contribution to the agriculture of Canada and of the world is so great that it baffles estimation.

The following extract is from his farewell address to the farmers of Canada: "Scientific Research in Agriculture in Canada is today in a deplorable condition. It is much talked about but to very little purpose, for it is not being encouraged. On the contrary, conditions are becoming worse rather than better. We need superior men, men of longer training, patient, skilful, far-seeing, enthusiastic. We must give these men when they can be found, all possible encouragement in the way of assistants, laboratories, adequate salaries and freedom in their work. We must respect them and trust them and demand no proofs of so-called efficiency. We must encourage silence rather than loquacity and never permit the publication of reports other than those which the research men—the only competent judges—deem necessary. The public must learn to wait. Only under such conditions can we look forward to some day reaping a harvest from the glorious possibilities which the future holds for Agricultural Research."

Just as the physician understands the human body so must the Agronomist understand the plant body.

The Attitude of Agricultural Colleges Towards the A. P. A.*

WM. A. KIRKPATRICK,

Storrs, Conn.

As a result of recent enquiries which have been made, I propose to set forth as briefly and as plainly as I can the attitude of the agricultural colleges towards the American Poultry Association.

I attempted first of all to ascertain what that attitude is today, not what it was ten years ago nor what it may be ten years hence, but just how the colleges now feel towards the A.P.A. I did not attempt to cover every institution in the country. I hope you will agree however that I took a fairly representative sample when I tell you that my conclusions are based on replies from Connecticut, Cornell, New Hampshire, New Jersey, North Carolina, Georgia, Maryland, Illinois, Indiana, Kansas, Wisconsin, Oregon, Ontario, Saskatchewan and the United States Department of Agriculture.

Among the very first replies to our inquiries was a letter that read about as follows: "As far as this university is concerned and as far as our poultrymen are concerned, taking them as a whole, they have and we have but little use for the A. P. A. We do not use the Standard of Perfection in our teaching work at all. Our time is devoted to production judging, in other words we feel that the American Poultry Association for the commercial poultryman is a thing of the past." Another teacher wrote: "When gold lettered, leather bound copies of the Standard are passed around to the officers of the association, each copy bearing the person's name and the man who did most of the work in revising most of the text does not as much as get a "thank you" for his time and effort, it looks as though the basis for action was politics and not poultry." Adverse criticism rightly received can sometimes be helpful though I do not hestitate to confess that if all my colleagues had written in a similar vein this address would probably never have been delivered. I have supposed, however, that you wanted the attitude of all the colleges and not merely of some of them and so I am trying to tell the plain, unvarnished truth in the hope that when all the cards are on the table there may result an everlasting good to both the American Poultry Association and the American agricultural college. We may be working along a little different lines but both institutions are trying to accomplish the self same purpose, namely the permanent betterment of the poultry industry in these United States.

Now let us proceed to criticisms that are perhaps still adverse, but less drastic, less superficial and at least partly constructive. Not less than three colleges and universities have criticized the Standard because it was either not properly edited or properly proof read. Of course you all know that virtually every college in the country that includes poultry in its curriculum uses the Standard of Perfection in the class room. I think therefore you will agree that there is some justification for criticising poor proof reading in a text book. I think, too, there can be but little excuse for the wrongful use of anatomical terms. From the teacher's viewpoint there is a vast difference between public and pelvic, between lay bones and lateral processes.

Furthermore teachers are at times at a loss to explain certain classifications. For example from a pedigogical point of view there seems to be no earthly reason why a compact, tight feathered, yellow skinned chicken like the Cornish should be dropped into the English class which is presumably characterized by birds a little larger than the American varieties, moderately loosely feathered and white skinned. I am of course aware that there are exceptions to all rules but there ought to be a reason. The only one I have been able to find in this case is that it gets the Cornish nearer the top of the list in the show room.

A middle western University suggests that a great many varieties of chickens have ap-

*An address before the American Poultry Association, Philadelphia, August, 1923.

parently been nearly spoiled by being bred to artificial standards or in other words that the A.P.A. has to all intents and purposes encouraged breeders to ride hobbies. Specific mention is made of the White Faced Black Spanish, Polish, Cochins, and others. It may be that the time is now at hand for the American Poultry Association to institute serious studies to determine the ultimate effect of standard requirements on some, if indeed not all of our principal and most useful breeds. There may be no reason why a bird can not look well and at the same time produce well, but it may also be possible to overdo fads.

There is one point on which the colleges of the country are almost universally agreed. I do not think I can state the case any better than to quote James G. Haplin of the University of Wisconsin when he said "this poultry department stands for just as beautiful poultry as we can have but insists that nothing shall be done to injure the economic qualities of our birds." I am confident that the great majority of folks who buy hatching eggs and day old chicks want stock with a production pedigree. Whatever it may be elsewhere I am certain that in Connecticut egg production is the real barometer of success in the hen business. In recent years many fanciers have tacitly admitted this by including in their advertisements a statement setting forth the excellent laying qualities of their particular strain. If you are willing to admit in your paid advertisements and other literature that eggs count then why can we not get together and talk this thing over in a friendly rational way, instead of each outdefying the other when both groups are trying to answer the same question: "What makes poultry more profitable?

Before turning to the other side of the story I want to say just a word about egg laying contests. I have to agree with M. E. Atkinson of Hollywood, Washington in saying that "the present average egg production in the United States is far too low. Economy, competition, desire for profit, and the pride each man should have in his own achievement demand a big improvement." I have for a dozen years been connected with the oldest laying contest in this country and I am convinced that they have helped some in this direction. W. H. Card writing in the August number of *Poultry Item* says that egg laying contests are the real reason for the great prosperity of the poultry industry today and he proceeds to urge exhibition breeders of Rhode Island Reds to enter their birds in these trials. And yet the contests have been laughted at, criticised and ridiculed by some of the foremost exhibition breeders in this country. One of them came to Storrs ten years ago incognito and then peddled at the New York show a story to the effect that he had personally seen the boy that bought the eggs that enabled Tom Barron's pen of Leghorns to win the ribbon. College men are not infallible, but I have an idea that the average teacher and the average experiment station worker is as honest and sincere in his effort as the run of the mill. Meanwhile egg laying contests in spite of blows below the belt have apparently made good in the minds of our constituents. My most unpleasant duty for many months was to write last week to forty-eight breeders in a dozen different states and say that on account of lack of room we could not accept their birds at Storrs.

Before closing I want to remind you that there is a silver lining to every cloud. So far as I know there is only one college anywhere that wants to wash its hands of the A.P.A. The attitude of the overwhelming majority of the colleges in this country and in Canada including the United States Department of Agriculture, is one of friendliness. A letter from North Carolina said "Nothing but the kindliest feeling for the A.P.A." and this from Wisconsin "We consider the American Poultry Association as a very prominent part of our American poultry business." Cornell puts it this way "Friendliness and co-operation towards the A.P.A." Kansas has "a very friendly interest in the A.P.A. and is anxious to cooperate in all constructive measures." The Ontario Agricultural College at Guelph said one word was enough for them: "Friendly." I might go on alluding to other institutions but surely this is enough to convince the most skeptical that although the colleges have felt fairly free to criticise they have at least intended their criticism to be constructive. The agricultural colleges do not for a mom-

ent hesitate to commend the American Poultry Association for the great good it has accomplished. I refer specifically to the development of poultry shows, to the way in which it has encouraged the publication of poultry periodicals, also to its aid and assistance in procuring in some cases state and federal aid for the establishment and maintenance of poultry departments and experiment stations. I must not omit the tariff on poultry and eggs which was a long hard fight in the national congress. Not least of all there is the Standard of Perfection. Imperfect though it may be I suspect that breeding without it would be chaos. All these and others I have not enumerated are a great and acknowledged credit to this association now celebrating its fiftieth anniversary. At the risk, however, of repeating a thought referred to earlier in this paper. I must remind you that there are not thousands but millions of poultrymen who must get enough eggs to pay for the feed and a little besides. They cannot begin on the top rung of the ladder of exhibition breeding. Somehow, someway, sometime we must get to these folks the most modern practises and principles in feeding, breeding and management and show them, too, the best type of hen. The colleges are anxious to help you help them. We are public servants whose motto must inevitably be "The greatest good for the greatest numbers." Finally, my friends, the colleges as well as you recognize the positive need for a great, national organization to foster and direct the larger affairs of a great and growing poultry industry. May that organization always be and remain the American Poultry Association.

Professional Notes.

C. Lyster (Macdonald '16) is now with the Dominion Live Stock Branch at the Union Stock Yards, Toronto.

C. H. Goulden (Saskatchewan '21) is taking graduate work at the University of Minnesota. His address is 2089 Carter Avenue, St. Paul, Minn.

N. C. MacKay (O.A.C. '11) who has been with the Extension Service of the Manitoba Department of Agriculture, now has his offices at the Agricultural College, Winnipeg, and is acting Director of Extension. This is the result of a recent re-organization of the service, whereby the Boys' and Girls' Club work is transferred to the Department of Education and extension work proper will be controlled by the Agricultural College.

James Laughland (O.A.C. '10) has been engaged as a special lecturer in Field Husbandry, in connection with the three months' courses in agriculture which are being conducted in Ontario.

R. R. Hurst (O.A.C. '22) has been appointed Assistant Pathologist at the Dominion Field Labratory of Plant Pathology, University of Saskatchewan, Saskatoon. He was formerly with the Department of Botany at the O.A.C.

G. J. Spencer (O.A.C. '14) is taking graduate work in Entomology at the University of Illinois.

R. L. Ramsay (O.A.C. '14) is now with the Soldier Settlement Board at Courtenay,B.C.

C. A. Good (O.A.C. '14) is now farming in Nova Scotia. His address is R.R. 1, Lawrencetown.

Le Mouvement en Faveur de L'Amélioration de la Vie Rurale aux Etats-Unis

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(suite de numéro de novembre)

2. Le Réveil de l'opinion.

La commission pour l'amélioration de la vie à la campagne.—En 1908, Théodore Roosevelt, alors Président des Ètats-Unis, nomma une Commission pour l'amélioration de la vie à la campagne, en vue d'obtenir d'elle tous renseignements et avis qui lui permettraient de faire des recommandations au Congrès dans l'intérêt de l'amélioration des conditions de la vie rurale.

La letter par laquelle le Président Roosevelt nomme cette Commission constitue une bonne introduction à l'étude de l'aspect social de notre vie rurale, tout comme en fait elle peut être considérée comme inaugurant le mouvement pour l'amélioration de la vie rurale en Amérique. Les passages suivants de cette lettre admettent de façon significative que l'aspect social de la vie rurale, considéré comme problème national, a été perdu de vue aussi bien par l'agriculteur que par l'homme d'État.

"Les institutions sociales et économiques de la campagne ne sont pas au niveau du développement de la nation envisagée comme un tout. L'agriculteur doit avant tout produire de bonnes récoltes pour vivre lui-même et faire vivre sa famille. Mais quand ce résultat a été atteint, l'effort en vue de réaliser une meilleure production ne devrait plus aller seul; il devrait avoir pour compagnon l'effort pour réaliser de meilleures affaires et pour vivre mieux à la compagne. L'agriculture n'est pas le tout de la vie rurale. Les grands intérêts de la campagne sont des intérêts humains et de bonnes récoltes sont de peu de valeur pour l'agriculteur si elles n'ouvrent la porte à un bon régime de vie à la ferme... La vie de la famille rurale peut-elle être rendue moins solitaire, plus riche en opportunités, plus affranchie des tâches pénibles, plus confortable, plus heureuse, plus attirante?... Comment peut-on en hausser le niveau? Comment éveiller chez l'enfant qui est né à la campagne un désir incoercible d'y vivre? Toutes ces questions sont d'importance vitale, non seulement pour l'agriculture, mais pour toute la nation... Personne n'exerce plus d'influence sur la vie de la nation que la femme de l'agriculteur; aucun *home* n'est important que le *home* des champs... Les agriculteurs n'ont pas eu jusqu'ici toute la part de l'attention publique à laquelle ils avaient droit en matière d'affaires et de vie sociale. On pense trop, dans tous les milieux, qu'on vit à la campagne une vie sans horizon" (1).

En réponse à la lettre du Président Roosevelt, la Commission pour l'amélioration de la vie à la campagne analysa les principaux défauts de la vie à la campagne, et indiqua les moyens d'y remédier. Trois importantes recommandations furent envoyées au Président Roosevelt.

Tout d'abord, la Commission recommanda que l'on dressât un vaste plan d'étude ou d'enquête sur toutes les conditions du milieu dans lequel s'écoule la vie de l'homme des champs. La Commission proposait la collaboration du Gouvernement fédéral et du Gouvernement des différents Ètats de la Confédération, des collèges d'agriculture et autres établissements d'instruction, des organisations de toute espèce et des investigateurs privés, en vue de réaliser la grande tâche d'une étude minutieuse de toutes les conditions auxquelles étaient assujetties l'agriculture et la vie rurale.

Secondement, un plan de campagne pour le progrès rural était dressé. La Commission estimait qu'il y aurait lieu de provoquer

(1) Rapport de la Commission pour l'amélioration de la vie à la campagne.

le réunion, par les soins de la Confédération et des divers États, de conférences qualifiées pour grouper les intérêts de l'éducation, des affaires et de la religion en un mouvement de progrès pour la réedification de la vie rurale.

Troisièmement, conformément aux recommandations de la Commission, chaque Faculté d'agriculture d'État serait mise à même d'organiser aussitôt que possible un service complet d'extension universitaire. Ce service comprendrait toutes formes d'enseignement comme conférences, bulletins, lectures et cours par correspondance, démonstrations, et autres procédés pour atteindre les gens à la maison et sur l'exploitation. Elle serait qualifiée pour promouvoir, non seulement les intérêts commerciaux de l'agriculture, mais l'hygiène, l'éducation, le ménage, et tous les intérêts intimes de la vie à la campagne.

L'attention nationale se concentre sur la famille rurale.—Le rapport de la Commission Roosevelt pour l'amélioration de la vie à la campagne fut déposé en décembre 1908. Bien que le Congrès ne donnât pas suite aux recommandations qu'il contenait, comme l'attendait le Président, il souleva de tous côtés l'intérêt sur les problèmes de la vie rurale. La presse donna sans tarder une large publicité à des questions qui n'avaient jamais trouvé place jusqu'alors dans une revue ou un quotidien. Des conférences d'État sur les sujets relatifs à la vie rurale, groupèrent la population rurale dans les Facultés d'agriculture, les Universités d'État et les écoles normales de presque tous les côtés des États-Unis. Les organisations d'agriculteurs, les corps religieux et les clubs d'affaires devinrent des centres de discussion de ce nouveau sujet. De 1909 à 1914 les quotidiens des villes, les revues nationales, les journaux hebdomadaires de la campagne consacrèrent une place toujours croissante au progrès de la vie rurale. En 1914, la tragédie de la guerre mondiale réduisit cependant un peu l'espace consacré par la presse aux aspects sociaux de la vie rurale, et en mit plus en relief l'aspect alimentaire.

Toutefois mouvement de conférences, de discours et de presse qui se poursuivit pendant les cinq années consécutives au dépôt du rapport de la Commission Roosevelt pour l'amélioration de la vie à la campagne laissa une trace distincte dans la pensée américaine. L'attention nationale était tournée vers les êtres humains qui vivaient à la campagne et vers les institutions dans le cadre desquelles s'organisait leur vie. On cessait en même temps de parler légèrement de l'agriculteur et de sa famille. Les faibles de la campagne cessaient d'être le point mire des plaisanteries, et un sérieux effort était entrepris pour comprendre les conditions sociales dans lesquelles vivait le travailleur de la terre.

Après une première floraison d'opinions et de remèdes superficiels, on en vint à se déterminer à l'étude sérieuse de toutes les phases de la vie humaine dans leur rapport avec la femme. On constitua des Commissions d'études sur la religion aux champs, sur l'education rurale, sur la santé, les distractions à la campagne. Les Facultés créèrent des chaires sur la vie rurale, et la "sociologie rurale" prétendit à prendre place parmi les sciences. Un groupe de jeunes économistes et sociologues spécialisés sur les questions rurales devint de plus en plus nombreux. Les théologiques commencèrent à donner leur attention au problème de l'église rurale. Les Bureaux d'État chargés des questions d'éducation entreprirent une politique d'orientation nouvelle des écoles rurales. L'oeuvre de l'extension universitaire ajouta "la maison et le *home* des champs" à ses séries de projections, et les Facultés d'agriculture et les corps religieux firent passer les premiers "examens" sur la vie rurale.

3. Comment se définissent les Problèmes Sociaux de la vie Rurale.

Considérations générales.—Il y a deux manières de définir les problèmes d'organisation de la vie tels qu'ils se présentent pour la population rurale des États-Unis, pleine d'élan et d'ambition. La première manière est suggérée par la lutte de la communauté agricole contre la vie et l'organisation de la frontière, et le problème se présente quelque peu en ces termes: Passer des avantages sociaux et de l'organisation sociale de la frontière aux avantages sociaux et à l'organisation modernes. Cette position du problème présuppose que le type du pionnier est disparu, mais que le type des institutions sociales de la frontière subsiste encore. La

solution consiste donc à réadapter les institutions sociales de la communauté agricole aux conditions de la vie moderne; à créer, s'il est nécessaire, de nouveaux modèles d'institutions, susceptibles de répondre aux besoins des temps nouveaux.

La seconde manière de résoudre le problème consiste à partir du caractère restrictif de ce qui entoure les occupations de l'agriculteur aux États-Unis, spécialement avant la vulgarisation de l'outillage agricole et la vulgarisation des connaissances scientifiques dans l'agriculture américaine. Cette restriction, due en partie aux longues distances qui séparaient les inhabitations rurales isolées, en partie au caractère isolant des travaux agricoles eux-mêmes, en partie à la langue action de la sélection naturelle du fait de laquelle les individus ayant davantage jeunesse vers les occupations de la ville, tend le besoin de société se dirigent dans leur naturellement à restreindre la liberté de contact de l'agriculteur avec le reste de l'humanité et avec l'esprit humain. Cette restriction du contact avec l'esprit humain contemporain explique dans une large mesure les défectuosités qu'on observe dans l'économie rurale, le dangereux état social de l'agriculteur américain, et la débilité bien connue de l'esprit d'initiative à la campagne. Le problème social peut, de ce point de vue, être posé comme suit: "Comment la population rurale pourra-t-elle se délivrer elle-même des restrictions et des entraves qui pèsent sur son genre de vie et son travail, qu'elles soient en quelque mesure imposées par les nécessités des circonstances ou acceptées aveuglément du fait de la tradition, dans une mesure assez grande pour que cette population étende sa connaissance des hommes et ses contacts avec l'esprit humain?" Un important corollaire de ce problème peut se poser ainsi: "Comment fonder et faire subsister à la campagne des institutions locales qui fortifient pleinement la personnalité individuelle de chacun des membres de la population rurale et qui confèrent à la classe rurale considérée dans son ensemble les pouvoirs d'une conscience sociale organisée?"

La solution du problème général s'est morcelée dans la pratique actuelle en une série de solutions dont chacune envisage un aspect du problème primitif. Nous pouvons reconnaître ces aspects aussi bien que des problèmes spéciaux. Nous avons ainsi: le problème de l'habitation rurale; le problème de l'école rurale; le problème de l'église rurale; le problème de la santé à la campagne; le problème de la réalisation d'un centre d'affaires complètement adéquat, pourvu de voies de communication suffisantes; le problème d'une municipalité rurale adéquate. Examinons ces problèms et considérons brièvement la situation présente de chacun d'eux.

Le problème de l'habitation rurale. — L'agriculteur américain bâtit sa maison, mais c'est la femme qui en assure la tenue. Elle souffre beaucoup plus des inconvénients d'une maison bâtie pour faire un abri plutôt le lieu de travail d'une femme, et elle accepte le poids du surmenage qui pèse sur son corps et sur son esprit.

"La longue journée passée sur la ferme, les lourdes charges à soulever et à transporter, le caractère constant et la nature minutieusement exacte des nettoyages, qu'il s'agisse de la maison, des ustensiles, des vêtements ou du corps, la bonne tenue de la maison l'exige absolument; or, tout cela pèse au plus haut point sur la résistance musculaire de la femme, même si celle-ci trouve placée dans les conditions les plus favorables; et sous la pression des nécessités perpétuellement renaissantes de la vie et du travail à la campagne, la vie de l'âme, chez la maîtresse de maison dont l'exploitation se fait entièrement à la main, souffre d'une éclipse perpétuelle, partielle ou entière.

"Le grand mérite du travail de la femme des champs, qui contraste si vivement avec le déoeuvrement de la femme dans la famille urbaine sans foyer, est couramment affublé de la livrée grise de la fatigue. Ainsi, le surmenage attaché à la maîtresse de maison comme une marque qu'elle porte au visage, voilà l'ennemi permanent de la vie de l'esprit dans l'existence à la campagne. Le problème des populations rurales à cet égard consiste en l'adoption de mesures permettant d'arracher le principal artisan de la réforme sociale du foyer rural, à la dépression, à la prostration et à la stagnation provenant, pour la femme, du surmenage musculaire."

Des grands progrès ont été réalisés durant les dix dernières années, dans la mod-

ernisation de l'habitation rurale en Amérique. Le recensement de 1920 montre que sept pour cent des habitations rurales ont le gaz ou la lumière électrique, et que dix pour cent sont pourvues de canalisations d'eau courante.

L'emploi de la gazoline ou de la force électrique ne fait pas l'objet de données statistiques applicables à tout le territoire des États-Unis; cependant il atteint jusqu'à dix pour cent des exploitations dans l'ensemble des comtés de certains États.

On a discuté des projets de lois sur l'habitation applicables aux territoires ruraux, avec des dispositions spéciales pour les maisons rurales cédées en location, et apparemment le jour n'est pas éloigné où l'opinion publique approuvera la tentative d'édicter des prescriptions minima pour les maisons en location, en ce qui concerne le nombre de pièces habitables, leur superficie, leur cube d'air, les dimensions des fenêtres, les conditions sanitaires et les possibilités de ravitaillement en eau potable.

La commodité de la cuisine rurale a soulevé l'intérêt de groupes de fermières durant les dernières années.

Le problème de l'école rurale.—Les défauts sociaux de la petite école rurale du type de la frontière peuvent être résumés comme suit;

"1) Le district territorial étant trop petit, il ne peut fournir assez d'élèves. L'enfant pourrait avec profit s'assimiler le connaissance de quatre fois autant de types de *homes*. Entre six et quatorze ans, cependant, il y a au moins quatre grands groupes d'âges, et les petites écoles, n'ont pas assez d'enfants pour remplir ces quatre groupes de manière à en assurer la vie. L'organisation des jeux parmi les enfants souffre en conséquence, et la possibilité du développement social dans les groupes est entravée.

"2) Un district de trois milles carrés, contenant de quinze à trente familles, est trop petit pour un développement efficace du contrôle. La démocratie gaspille ses forces dirigeantes dans une si petite unité.

"3) L'unité territoriale fiscale est trop petite. Les inégalités dans la capacité taxable ne peuvent être nivelées que grâce à une large unité fiscale.

"4) L'inspection politique des comtés fait peser une lourde pénalité sur les petites écoles. Les bons résultats d'une école, quand ils sont à la merci des passions politiques, sont exploités pour servir les ambitions personnelles des simples politiciens.

"5) La petit école reste en dehors d'un cycle d'écoles plus élevées ou d'écoles complémentaires. De ce fait résulte non seulement une sérieuse lacune dans l'éducation, mais une limite au développement social qu'on ne peut que difficilement surmonter.

"6) Toutes les causes d'échec psychologiques de l'agriculture, concentrées dans la petite école et symbolisées par elle, sont perpétuées apparemment par l'étroitesse de cette école."

La solution généralement acceptée pour le problème de l'école rurale élémentaire est de doter l'enfant d'une école à large envergure, d'un groupe scolaire de district, ayant six fois autant d'élèves que la petite école de district.

"Partout où la réorganisation de l'école rurale est entreprise en Amérique, en toute vraisemblance la petite école rurale doit disparaître dans une génération, tout comme recontre parfois un écrivain qui s'offre à le poêle, le cheval, la lampe, la bougie. On rencontre parfois un écrivain qui s'offre à défendre le type de la petite école sur le terrain de la psychologie rurale. On a prétendu que l'esprit rural est uniforme, synthétique, massif, simple, et que l'école sans degrés convient à l'esprit, au tempérament, à l'idéal de l'agriculteur. La force de cet argument repose manifestement sur un examen des caractéristiques mentales de l'agriculteur sans machines, mais elle se réduit à néant devant la psychologie de l'agriculteur pourvu d'outillage mécanique. Dans la transition d'un type mental à l'autre, la petite école a sa part, une part que les avocats modernes du groupement et de la centralisation ne doivent pas considérer à la légère. Quand l'agriculteur sans machines se montre attaché opiniâtrément à sa petite école, une appréciation sympathique de son cas doit conduire à la socialisation com-

plète de tous les aspects possibles de la petite école. Dans l'espérance que la petite école socialisée puisse devenir an instrument pour créer une opininion favorable au groupement des écoles, on doit pouvoir attendre jusqu'à ce que l'entourage dépourvu d'horizon intellectuel de l'agriculteur sans machines en vienne à demander une organisation scolaire plus importante.

"La loi peut aussi être un instrument du groupement scolaire, en offrant de grands encouragements au groupement libre, et en préparant la mort automatique de l'école qui est au-dessous de la moyenne. Cette loi est inspirée par la crainte qu'en temporisant avec un instrument scolaire insuffisant on ne renforce l'agriculteur sans machines dans sa position et ne recule son accession à un meilleur genre de vie rurale. Certains États sont en train d'essayer l'une et l'autre méthodes. On dit que l'obligation de la réunion des écoles convertit rapidement l'agriculteur obstructionniste en cotisant enthousiaste. D'autre part, on prétend que la petite école, lorsqu'elle est socialisée, change rapidement l'esprit social à la campagne, et conduit au groupement scolaire libre."

L'histoire du groupement scolaire rural en Amérique, avec ses degrés, son personnel de maîtres bien rétribués, son système de transport des écoliers de leur domicile à l'école et vice-versa, été comme hiver, aux frais du public, est un vrai roman. Elle donne bon espoir pour tout le mouvement pour l'amélioration de la vie à la campagne.

Le problème de l'église rurale. — "C'est l'église étroite, sans force, sans pasteur, mal placée, qui tend à abandonner l'agriculture à un individualisme destructeur. C'est l'église forte, avec une noble architecture permanente, bien située, avec un homme de valeur comme pasteur résident, qui unifie l'agriculture; une agriculture unifiée nourrit l'église à son tour. Comment atteindre ce but si grandement désirable dans le futur développement de l'église rurale, sans diminuer d'aucune manière les buts et objets religieux de l'église même, tel est l'aspect de la situation de l'église rurale qui se présente à l'agriculture comme un problème."

On rencontre en Amérique quatre types d'églises rurales: l'église en pleine campagne; l'église édifiée au milieu d'un petit groupement ou hameau; l'église de village; l'église de petite ville. Quatre-vingt-dix pour cent des fidèles de l'église en pleine campagne sont engagés dans l'agriculture; dans l'église de hameau on en compte soixante-quinze pour cent; dans l'église de hameau on en compte soixante-quinze pour cent; dans l'église de village cinquante pour cent; dans l'église de petite ville quinze pour cent.

"Une comparison sociale et économique entre ces quatre types d'église conduit aux conclusions suivantes: Il y aura, même dans les États ayant dépassé le stade de la colonisation, pendant au moins une génération, des districts intérieurs, éloignés de sept à vingt milles de tout centre commercial important, avec une population suffisamment nombreuse et compacte qui n'aura pratiquement d'autre ressource religieuse que l'église en pleine campagne. Bien plus, il y a des groupes d'agriculteurs, relativement peu importants, dont l'intérêt de groupe historique compense peut-être beaucoup de désavantages économiques et sociaux, où l'église en pleine campagne continuera d'agir avec succès. Cependant, dans les territoires neufs, sous les restrictions qu'impose l'existence des pionniers, là où les conditions sociales et économiques sont dans le devenir, on devrait reconnaître qu'avant d'établir une église autonome en pleine campagne plutôt que dans un centre économique étroitement en rapport avec l'agriculture, il faudrait étudier avec le plus grand soin tous les éléments impliqués, le poids de la balance devant pencher, au point de vue social, du côté du centre d'affaires.

"L'église de hameau, ayant le caractère d'une communauté, peut, dans la génération qui vient, remplacer largement l'église en pleine campagne pour des raisons purement géographiques.

"On estime qu'assez peu d'églises de village ont chacune la force suffisante, et il est aisé de voir que la démocratisation de l'église de village, jointe à sa stabilité probable et à une plus étroite adaptation au choix particulier de la foi de l'agriculteur, place ce type dans une situation spécialement avantageuse.

C'est pourquoi l'église de village est nettement appelée à être dans l'avenir l'église normale de l'agriculteur.

"Dans le passage du type traditionnel d'agriculture à une agriculture reposant sur des bases scientifiques, et d'une vie rurale individualiste à une économie rurale socialement adaptée aux besoins de chacun, l'église stable de la petite ville a un important rôle stratégique à jouer. Que le résultat soit ou non l'accroissement considérable des quinze agriculteurs sur cent qui la fréquentent, il est peut-être oiseux de le prédire. Si toutefois l'ancien fossé qui existe entre l'agriculteur et le commerçant peut être socialement comblé, on pourra compter, d'ici une génération, dans l'église de la petite ville, trente pour cent d'agriculteurs. Dans ce cas l'église de village pourrait trouver son plus redoutable concurrent pour l'agriculteur dans l'active église démocratique de la petite ville agricole."

La solution des problèmes cultuels de la population rurale américaine a reçu récemment une grande impulsion du fait de la nomination, par plusieurs des grandes organisations religieuses, d'organisations nationales et de directeurs dont les fonctions sont particulièrement relatives à la réorganisation des églises rurales. Bien plus, des plans de coopération entre ces diverses organisations religieuses de dénominations différentes ont permis la réalisation de grands progrès en réduisant une concurrence désavantageuse entre les groupes locaux d'églises rurales.

Le problème de la santé rurale.—Une des plus grandes énigmes est le problème des moyens de passer des maigres ressources sanitaires des terres de colonisation aux commodités de la vie moderne. Les villes possèdent des hôpitaux, des dispensaires, des cliniques, des spécialistes pour les diverses maladies, outre une légion de médecins. La campagne n'a guère de toutes ces resources sanitaires.

Cependant le côté brillant du mouvement en faveur de la vie à la campagne apparaît dans des exemples isolés d'hôpitaux de montagne d'origine philanthropique pour la population rurale; dans quelques comtés on rencontre aussi des hôpitaux spécialement construits pour la population rurale par les autorités locales; d'autre part certains comtés ont promulgué des lois pour assurer l'inspection hygiénique des écoles de la campagne, et les *nurses* chargées de cette inspection donnent des conseils d'ordre sanitaire et hygiénique; on compte enfin diverses études, faites par les soins de fondations philanthropiques, de maladies qui sévissent particulièrement à la campagne, comme la malaria et la pellagre.

L'hôpital moderne semble la clef de voûte de la solution du problème sanitaire de la population agricole. Mais un système hospitalier pratique requiert la construction d'un réseau de communications suffisant, et repose sur celui-ci.

Le problème du centre d'affaires à la campagne.—En 1920, l'Amérique compait une population agricole de 31,614.269 personnes de tout âge, soit presque trente pour cent de la population totale des États-Unis, un peu moins d'un tiers, et un peu moins que le chiffre global des personnes vivant dans des villes ayant de 25.000 à cinq millions d'âmes. Les experts en sociologie rurale conviennent assez généralement que notre population agricole est gravement tenue en échec dans la lutte pour l'égalité sociale avec les autres citoyens en ce qui regarde les conditions de la vie, en dehors de ses difficultés économiques, en raison de l'impossibilité relative où elle se trouve présentement d'atteindre à la jouissance des avantages sociaux de la vie moderne et de ses facilités. J'invite l'attention du lecteur à s'attarder un moment sur ce point, qui n'est pas aussi simple qu'on pourrait le supposer.

Le fait est que le problème de cette impossibilité qu il y a pour le foyer rural à atteindre à la jouissance des commodités, des services et des institutions techniques de l'époque contemporaine, ne se traduit pas simplement par une position d'attente jusqu'à ce que les agriculteurs ou d'autres catégories de citoyens puissent avoir les moyens d'améliorer toutes les voies de communication rurales. Il est beaucoup plus complexe que cela, quelque difficile que puisse être à résoudre la question des communications. Les experts en sociologie rurale sont en train de montrer que la population rurale, qui compte trente et quelques millions d'individus, est en voie de se mettre en contact avec les avantages et la pensée du reste du monde, par l'intermédiaire de commerçants privés isolés dans la campagne, petits groupes de hameaux de villages impuissants, d'institutions locales absolument insuffisantes, provenant de la plupart des intéressés eux-mêmes, sans qu'on puisse leur en imputer les défauts. En face de cela, les trente et quelques millions d'individus vivant dans les villes de 25.000 âmes et plus sont en train d'être mis en contact immédiat avec le meilleur des avantages, de l'habileté et de la pensée de l'univers, grâce à toutes les inventions et à toutes les facilités que l'ingéniosité de nos contemporains a creées.

On aboutit à un énorme problème des transports: Comment procurer les facilités de l'existence, comment mettre les inventions avantageuses, comment transporter les institutions scientifiques, dans leur ensemble, et les répartir avec tant d'uniformité par chemin de fer ou par eau, pour que, grâce à un système suffisant de voies de communications, un groupe déterminé de population rurale puisse trouver rassemblées, sur un même point terminus, la plupart des choses qu'il désire? En un mot, cette situation de la population rurale appelle un système de centres suffisants, complets, terminus reliés par voie ferrée ou par eau avec les villes où se fait la vente en gros. Ces centres terminus, comptant une population de 1.500 à 5.000 âmes, chacun d'eux étant en rapports, par un système suffisant de voies de communications, avec un groupe de population rurale de 2000 à 7000 âmes, tariraient les sources de mécontentement chez les agriculteurs, et, selon l'expression de Théodore Roosevelt, "ouvriraient la porte à un meilleur genre de vie à campagne."

Les ingénieurs qui construisent les routes devraient connaître cette situation sociale de l'agriculteur, non seulement en vue d'aider à la résoudre, mais aussi pour ne pas entraver à leur insu l'avènement d'une ère nouvelle pour l'agriculture, en ligotant celle-ci dans un système de voies de communications qui la condamnent au régime du temps des pionniers pour une autre génération.

L'Amérique a déjà 1320 centres terminus de 2.500 à 5.000 âmes. Ceux-ci peuvent pour la plupart, être compris dans un système complet et efficace de terminus de voies ferrées pour la population rurale.

Le problème de la municipalité rurale.— Une des caractéristiques de ce qui reste du régime des pionniers dans la vie rurale, c'est le type du gouvernement local. Comment le transformer en une municipalité moderne, voilà un des problèmes sociaux et politiques les plus embarrassants qui soient. Le village et la ville des États-Unis sont des municipalités modernes, mais la population rurale vit en dehors de ces unités politiques et en général, quoique avec quelques exceptions, elle conduit ses affaires locales dans un *township* de forme uniformément carée, contenant trentesix milles carrés.

Il y a quelque mouvement, dans plusieurs États, pour amener la population rurale à créer, par voie législative, une nouvelle circonscription municipale dans laquelle puisse fonctionner un gouvernement local moderne mieux adapté aux besoins actuels.

La création de nouveaux types de circonscriptions ou de districts en vue d'entretenir des écoles rurales de caractère moderne, ou des bâtiments affectés aux distractions de la population rurale, pratique maintenant générale dans tous les États, marque la voie qui doit conduire au nouveau type de municipalité adaptée à tous les besoins du gouvernement local.

(à suivre)

Book Reviews.

"BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY."

(Williams & Wilkins Company, Baltimore.)

This book has been prepared by a Committee of the Society of American Bacteriologists, consisting of David H. Bergey, Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa., Chairman; and Francis C. Harrison, Macdonald College, P.Q., Canada; Robert S. Breed, New York Agricultural College, Geneva, New York; Bernard W. Hammer, Iowa State College, Ames, Iowa; and Frank M. Huntoon, Glenolden, Pennsylvania.

The manual is of particular interest to all students of bacteriology who desire to differentiate the various species of bacteria. No book of this character has appeared since Chester's "Determinative Bacteriology" and Migula's Text-book, and as both of these are now more than twenty years old, the need for such a manual is certainly indicated.

The more complete species of each genus are described in brief form in this manual, and it is intended that it will be kept up-to-date, and as additional species are studied in detail, and results published, they will be added to the list.

An invitation is extended to bacteriologists to draw attention to possible errors in the text, and they are requested to furnish complete descriptions of new organisms that may be discovered, or draw the attention of the Committee to publications of such newly discovered bacteria.

The classification presents many new features, and has many changes that may be distasteful to many. For example, many bacteriologists will be perturbed at finding their old friend *Bacillus prodigiosus* under its new name of *Serratia marcescens*. However, by splitting up some of the old genera, the task of running down species has been considerably lightened.

F.C.H.

Concerning the C.S.T.A.

APPLICATIONS FOR MEMBERSHIP

F. Dimmock (McGill, 1923, B.S.A.) Macdonald College, P.Q.

J. B. Ferland, (Laval, 1917, B.S.A.) Ste. Marie, P.Q.

A. S. Hammersley (Saskatchewan, B.S.A.) Bedford Road Collegiate, Saskatoon, Sask.

H. W. Herridge (Associate) Nakusp, B.C.

W. H. Upshall (Toronto, 1923, B.S.A.) Vineland Station, Ont.

J. A. Neilson (Toronto, 1915, B.S.A.; Iowa, 1923, M.S.), Vineland Station, Ont.

A. Pelletier (Laval, 1920, B.S.A.) Chateau Riche, P.Q.

A. E. Richards (British Columbia, 1923, B.S.A.) Summerland, B.C.

P. M. Simmonds (McGill, 1922, B.S.A.) University of Saskatchewan, Saskatoon, Sask.

R. G. Sutton (Toronto, 1920, B.S.A.) Prince George, B.C.

WHO'S WHO.

Immediately following the publication of this issue, the General Secretary will proceed with the preparation of biographical sketches of the members, for publication in the C.S.T.A. Who's Who early in 1924. Each biography will be submitted to the member concerned before printing. A leaflet outlining the proposed volume is enclosed in all copies of this issue which are addressed to members of the Society. Suggestions and criticisms will be appreciated.

COMMITTEE ON GRADUATE STUDY

Dr. R. Newton of the University of Alberta has found it necessary to resign the Chairmanship of the above Committee, a post which he has filled with considerable credit since June, 1922. His successor has not yet been appointed.

ACTIVITIES OF LOCAL BRANCHES

ALBERTA:

A meeting of this local was held on November 7th, taking the form of a dinner and programme. Addresses were given by Professor J. P. Sackville on "Experimental Work in Live Stock Feeding" and by Professor Cutler on "The Work of the Alberta Crop Improvement Association." Both these addresses will be published in an early issue of *Scientific Agriculture.*

Mr. H. A. Craig, Deputy Minister of Agriculture, gave a report of the Saskatoon Convention.

The local elected Mr. S. G. Freeborn, as Secretary-Treasurer, succeeding Mr. C. E. Bain who was recently transferred to Winnipeg.

BRITISH COLUMBIA:

The annual fall meeting of the B.C. local was held at Vancouver on November 28th. An afternoon session was given over to business, followed by a dinner and evening session, arranged as "A symposium of three marketing phases of British Columbia agriculture, viz.: Dairying, Horticulture and Poultry."

MARITIME PROVINCES:

A joint banquet of the three Maritime locals will be held during the week of December 10th, at the time of the Amherst Winter Fair. Professor H. Barton and Dr. G. C. Creelman have accepted invitations to address the members on this occasion.

WESTERN ONTARIO:

Under the joint auspices of the above branch of the C.S.T.A. and the Central Ontario O.A.C. Alumni Association, a banquet was held at the King Edward Hotel, Toronto, on the evening of November 22nd, during the week of the Royal Winter Fair. There were 170 in attendance, including C.S.T.A. members from every province in the Dominion. Prof. A. Leitch, President of the C.S.T.A. in Western Ontario, presided. The success of this gathering ensures its continuance as an annual event.

The principal speakers were Hon. John S. Martin, Minister of Agriculture for Ontario, Prof. H. Barton, President of the C.S. T.A., Dr. M. Cumming, Principal of Nova Scotia Agricultural College and Se tary for Agriculture for Nova Scotia, Mr. E. S. Archibald, Director of the Dom ion Experimental Farms. At the close these four addresses, the Chairman cal upon the following for short talks—Hon. Myers, Minister of Agriculture for Pri Edward Island; Hon. D. E. Mersereau, M ister of Agriculture for New Brunswi Hon. George Hoadley, Minister of Agric ture for Alberta; Hon. Duncan Marsh Dominion Commissioner of Agricultu Prof. W. L. Carlyle, Manager of the Pri of Wales' ranch in Alberta; and Dr. G. Creelman, formerly President of the Onta Agricultural College.

NORTH SASKATCHEWAN:

A series of six monthly meetings has b arranged, to be held at the King Geo Hotel, Saskatoon. Dinner is served at p.m., the meeting adjourning at 8 o'clo The speakers are as follows:

Nov. 5—J. G. Robertson, Live Stock Co missioner for Saskatchewan.

Dec. 4—J. M. Varey, Soldier Settlem Board, Saskatoon.

Jan. 8—L. E. Kirk, Professor of Field H bandry, University of Saskatc wan.

Feb. 4—Roy Hansen, Professor of So University of Saskatchewan.

Mar. 4—W. P. Thompson, Professor Biology, University of Saskatc wan.

Apr. 1—W. J. Rutherford, Dean of the F ulty of Agriculture, University Saskatchewan.

TEXT BOOK CLUB

Members are not taking full advantage the Text Book Club which is being opera through the office of the General Secreta A clear saving of 20 per cent. on all bo can be made by using this Club. See advertisement elsewhere in this issue write the various publishers for their ca log. Then order through the C.S.T.A. pay all postage charges and deduct 20 cent. from your invoice.